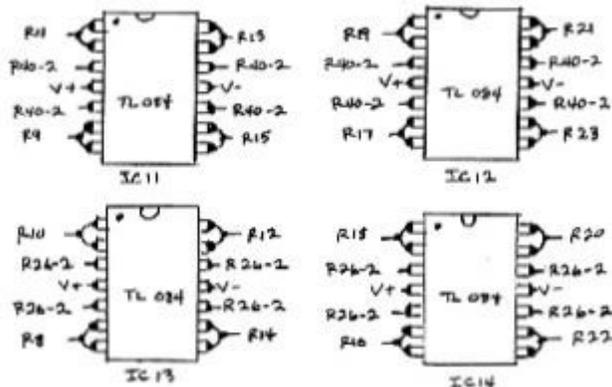


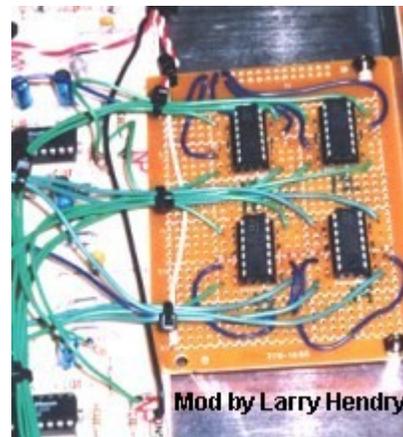
Vocoder Clarifier Modification

This mod to the 6710 Vocoder reduces background noise and improves the overall balance of the bands. A voltage follower op-amp circuit (buffer) inserts at the input to each filter, isolating the IN1 and IN2 level controls from the eight filters they feed. Each voltage-follower buffer drives its own load instead of the variable resistance of the level controls driving all eight. The stronger signal improves the signal to noise ratio. Additionally, updates to band summing resistor values flatten the mix and to some extent, also lower noise due to reduced gain of the summing amp.

A general purpose DIP IC Component PC Board available at Radio Shack (276-168b) makes it easy to add the four ICs and wiring for the mod. The board is full of holes and soldering points/grids optimized for wiring IC circuits. Sockets for the four ICs can be soldered and connections between the output pin to the inverting (-) input pin is easily made with a wire jumper. Two busses facilitate common circuit connections and the IN1 and IN2 taps can distribute to IC pins on these. The IN1 and IN2 taps, the buffered outputs, and the V+/V- power supplies connect using #22 insulated, stranded wire (about a foot for each connection with the mod board situated behind and at about the middle of the vocoder circuit board).



The connections to the ICs on the mod board.

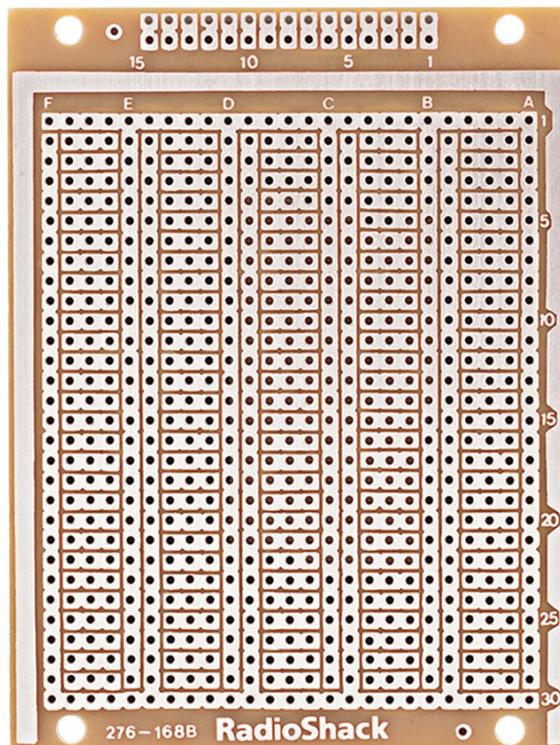


The modification circuitry built onto a DIP IC experimenter's board.

Notice on the Vocoder that the IN1 and IN2 level controls wire to circuits from their #2 terminals (via wire P for IN1 and wire Y for IN2) and these two circuits each have eight 4700 ohm (yellow-violet-red-gold) spaced across the board which are the inputs to the band filters. Remove and discard the P and Y wires – they will be replaced with new ones to the mod board. Desolder and lift the ends of the 4700 ohm filter input resistors from the printed circuits that tie them to the P and Y wiring points -- they become the connecting points for the mod board buffer outputs.

The summing resistors which set the mix of the bands should be replaced before the mod board and its wiring are added. Remove resistors R31, R32, R3, R4, R33, R34, R5, and R35. Install 33k (orange-orange-orange-gold) resistors at all these positions except R5 and R35. Install a 22k (red-red-orange-gold) at R5 and a 68k (blue-grey-orange-gold) at R35.

Finally, wire the mod board to the points on the Vocoder. When making the connections to the filter input resistors with the wires from the buffers, a piece of tubing can be slipped over the wire before it's soldered to the end of the resistor so the joint can be covered/insulated. Make the V+ and V- connections from the mod board to the Vocoder power supply (there is no ground circuit to the mod board). Test operation.

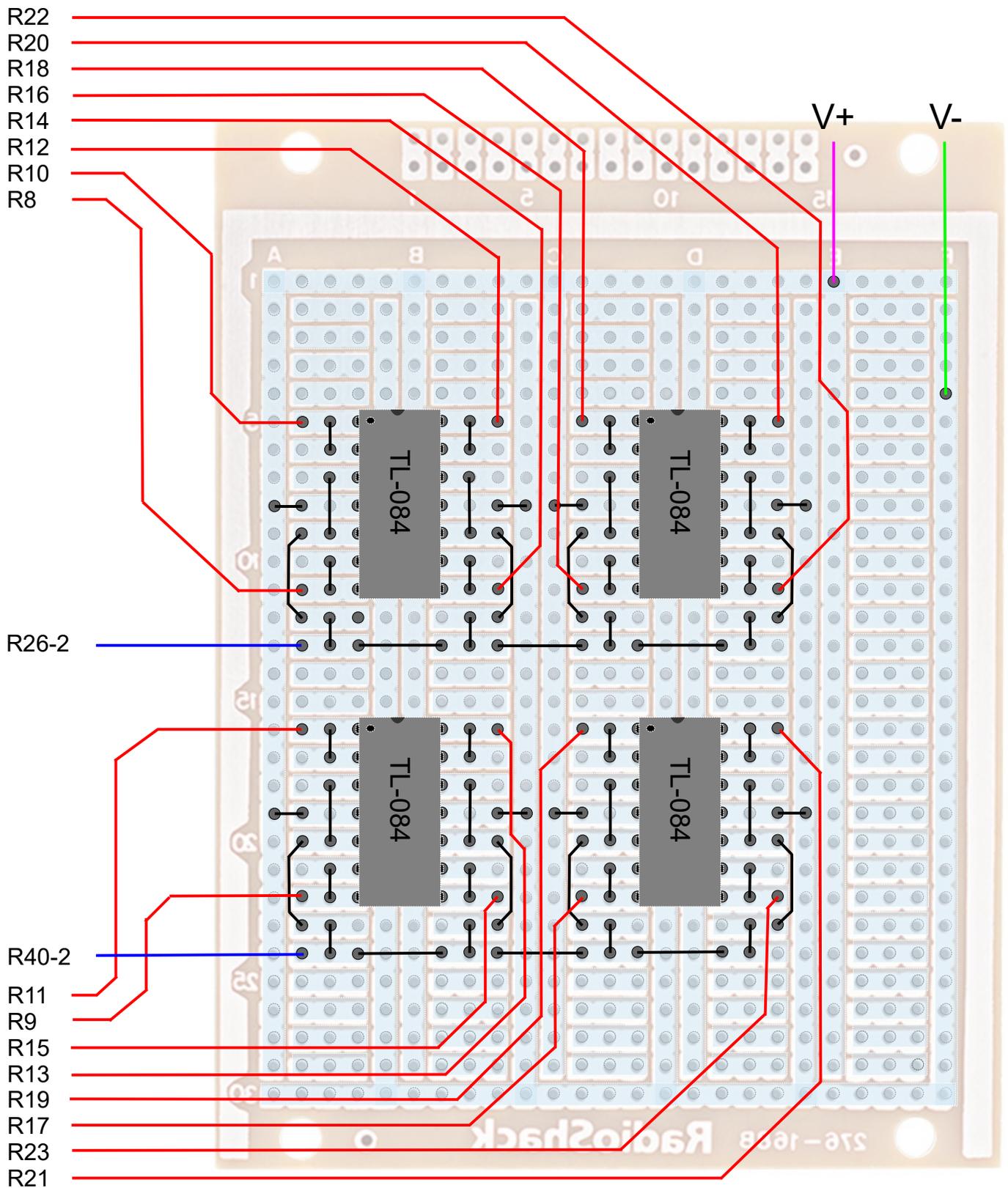


This is a photo of the bottom, solder-side of Radio Shack's DIP IC Experimenter's Board, catalog number 276-168 "Universal Component PC Board with 780 Holes".

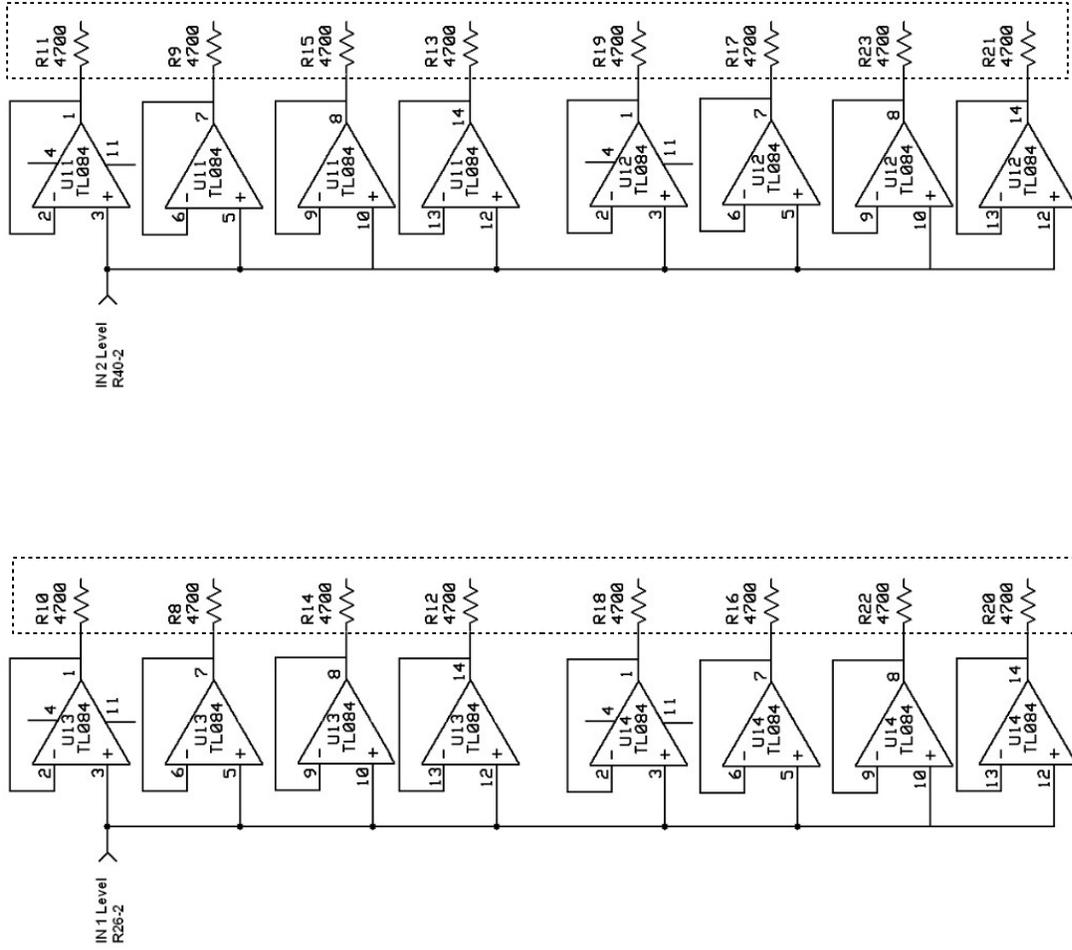
<http://www.radioshack.com/universal-component-pc-board-with-780-holes/2760168.html>

The top left hole and the one below it are where $V+$ and $V-$ from the vocoder can be wired and these power supply voltages will then be accessible at nearby points for the power supply pins of the four installed quad op-amp ICs (TL-084) as depicted in the following examples.

The ICs straddle these interleaved power supply bus strips and when soldered in place will have two solder points for each pin. Scroll down to see the accompanying placement and connection examples.



ICs and wiring installed on top side of component board with see-through view to the bottom side copper areas.



Updated band mix resistor values

- R31 33K
- R32 33K
- R3 33K
- R4 33K
- R33 33K
- R34 33K
- R5 22K
- R35 68K

These resistors have the end that had connected to the IN 1 and IN2 Level controls lifted for wiring points with the buffers.

PAiA

Buffer Board for Vocoder Inputs